

## APPENDIX K

### TEMP DROP CODE

EXTRACT FROM: WMO-No. 306 MANUAL ON CODES

FM 37-IX Ext. TEMP DROP - Upper-level pressure, temperature, humidity and wind report from a sonde released by carrier balloons or aircraft. Figure E-1 is an example TEMP DROP message.

#### CODE FORM:

##### PART A

SECTION 1     $M_i M_i M_j M_j$      $YYGGI_d$      $99L_a L_a L_a$      $Q_c L_o L_o L_o L_o$      $MMMU_{L_a} U_{L_o}$

SECTION 2     $99P_o P_o P_o$      $T_o T_o T_{ao} D_o D_o$      $d_o d_o f_o f_o f_o$

$P_1 P_1 h_1 h_1 h_1$      $T_1 T_1 T_{a1} D_1 D_1$      $d_1 d_1 f_1 f_1 f_1$

$P_n P_n h_n h_n h_n$      $T_n T_n T_{an} D_n D_n$      $d_n d_n f_n f_n f_n$

SECTION 3     $88P_t P_t P_t$      $T_t T_t T_{at} D_t D_t$      $d_t d_t f_t f_t f_t$   
or  
88999

SECTION 4     $77P_m P_m P_m$      $d_m d_m f_m f_m f_m$      $(4v_b v_b v_a v_a)$   
or  
 $66P_m P_m P_m$      $d_m d_m f_m f_m f_m$      $(4v_b v_b v_a v_a)$   
or  
77999

SECTION 9    51515 (through 59595) Code groups to be developed regionally.

SECTION 10    61616 (through 69696) Code groups to be developed nationally.

##### PART A

#### SECTION 1 - IDENTIFICATION AND POSITION

$M_i M_i$     Identification letters of the report = XX

$M_j M_j$     Identification letters of the part of the report = AA

YY    Day of the month (GMT). When wind data are included 50 is added to YY.

GG    Actual time of the observation, to the nearest whole hour (GMT).

$I_d$     Highest mandatory level for which wind is available. 7=700 mb, 5=500 mb, etc. If flight level is above a standard surface, for example 495, report a 5 for 500 mb in the  $I_d$  group.

*Note the following clarification was approved at the 52d IHC:  $I_d$  will specify in hundreds of mb (Part A) or tens of mb (Part C) the highest mandatory isobaric level for which the wind is reported. For example, in Part A,  $I_d = 7$  indicates 700 mb, but in Part C,  $I_d = 7$  indicates 70 mb.  $I_d = 0$  refers to the 1000 mb level. The surface wind group should always be present.*

*(1) The wind group shall be omitted at all levels above the level specified by  $I_d$ , except as noted in (3) and (4) below.*

(2) The wind group shall be present at all levels at and below the level specified by  $I_d$ . At levels below that specified by  $I_d$  for which the wind is missing, encode the wind group as "////.".

(3) When the highest mandatory level for which the wind is reported is 250 mb, encode  $I_d$  as 2. If other information is available above 250 mb, encode the 200 mb wind group as "////.".

(4) When the highest mandatory level for which the wind is reported is 150 mb, encode  $I_d$  as 1. If other information is available above 150 mb, encode the 100 mb wind group as "////.".

(5) When no winds are reported for any level, encode  $I_d$  as "/", encode the surface wind group as "////," and omit all wind groups above the surface.

99 Indicator for data on position follow.

$L_a L_a L_a$  Latitude, in tenths of a degree.

$Q_c$  Quadrant of the globe. The earth is divided by the Greenwich meridian and the equator into quadrants. The code figure reported depends on the latitude and longitude of the observation position.

$L_o L_o L_o L_o$  Longitude, in tenths of a degree.

MMM Marsden square. The number of the marsden square for aircraft position at the time of the observation is reported for MMM. Always report three digits for MMM, with zeros reported for the hundreds and tens digits when required. When an observation is within a depicted 10 degree square, report the number of that square. When on an even 10 degree latitude or longitude circle, the marsden square for MMM is obtained by moving in the direction of larger latitude and/or longitude. EXAMPLE: Assuming a position of 18.1N, 131.4W, MMM is 050; assuming a position of 30.0N, 140.0E, MMM is 130. At the equator or on the prime meridian, report the marsden square compatible with the  $Q_c$  reported.

$U_{La}$  Units digit in the reported latitude.

$U_{Lo}$  Units digit in the reported longitude.

## SECTION 2 - SURFACE AND STANDARD ISOBARIC SURFACES

99 Indicator for data for the surface level follow.

$P_o P_o P_o$  Pressure of specified levels in whole millibars, thousands digits omitted. ( $P_o P_o P_o$  is always surface level.)

$P_1 P_1$  Pressure of standard isobaric surfaces in units of tens of millibars. (1000mbs=00,  
 $P_n P_n$  925mbs=92, 850mbs=85, 700mbs=70, etc.)

$h_1 h_1 h_1$  Height of the standard pressure level in geopotential meters or decameters above the surface. Encoded in meters up to but not including 500mbs. Encoded in decameters at and  
 $h_n h_n h_n$  above 500mbs omitting, if necessary, the thousands or tens of thousands digits. Add 500 to hhh for negative 1000mb heights. Report 1000mb groups as 00/// //// when surface pressure is less than 950mbs.

$T_o T_o$  Tens and units digit of air temperature (not rounded off) in degrees Celsius, at specified  
 $T_1 T_1$  levels beginning with surface.

$T_n T_n$

$T_{ao}$  Approximate tenths value and sign (plus or minus) of the air temperature.

$T_{al}$  Even = plus; Odd = minus.

$T_{an}$

D <sub>0</sub> D <sub>0</sub> D <sub>1</sub> D <sub>1</sub> D <sub>n</sub> D <sub>n</sub>	Dewpoint depression (with respect to water) at standard isobaric surfaces beginning with surface level. When the depression is 4.9C or less encode the units and tenths digits of the depression. Encode depressions of 5.0C through 5.4C as 50. Encode depressions of 5.5C through 5.9C as 56. Dewpoint depressions of 6.0C and above are encoded in tens and units with 50 added. Dewpoint depressions for relative humidities less than 20% are encoded as 80. When air temperature is below -40C report D <sub>n</sub> D <sub>n</sub> as two solidi.
d <sub>0</sub> d <sub>0</sub> d <sub>1</sub> d <sub>1</sub> d <sub>n</sub> d <sub>n</sub>	True direction from which wind is blowing rounded to nearest 5 degrees. Report hundreds and tens digits. The unit digit (0 or 5) is added to the hundreds digit of wind speed.
f <sub>0</sub> f <sub>0</sub> f <sub>0</sub> f <sub>1</sub> f <sub>1</sub> f <sub>1</sub> f <sub>n</sub> f <sub>n</sub> f <sub>n</sub>	Wind speed in knots. Hundreds digit is sum of hundreds digit of speed and unit digit of direction, i.e. 295° at 125 kts encoded as 29625. (Notes 1&2)

NOTE: 1. When flight level is just above a standard surface and in the operator's best meteorological judgement, the winds are representative of the winds at the standard surface, then the operator may encode the standard surface winds using the data from flight level. If the winds are not representative, then encode /////.

2. The wind group relating to the surface level (d<sub>0</sub>d<sub>0</sub>f<sub>0</sub>f<sub>0</sub>) will be included in the report; when the corresponding wind data are not available, the group will be encoded/////.

### SECTION 3 - DATA FOR TROPOPAUSE LEVELS

88	Indicator for data for tropopause level(s) follow.
P <sub>t</sub> P <sub>t</sub> P <sub>t</sub>	Pressure at the tropopause level reported in whole millibars.
T <sub>t</sub> T <sub>t</sub>	Air temperature in whole degrees Celsius, at the tropopause level.
T <sub>at</sub>	Approximate tenths value and sign (plus or minus) of the air temperature at the tropopause level.
D <sub>t</sub> D <sub>t</sub>	Dew point depression at the tropopause level.
d <sub>t</sub> d <sub>t</sub>	True direction at the tropopause level rounded to nearest 5 degrees. Report hundreds and tens digits. The unit digit (0 or 5) is added to the hundreds digit of wind speed.
f <sub>t</sub> f <sub>t</sub> f <sub>t</sub>	Wind speed in knots. Hundreds digit is sum of hundreds digit of speed and unit digit of direction, i.e. 295° at 125 kts encoded as 29625.
88999	Indicator that tropopause data have not been observed.

### SECTION 4 - MAXIMUM WIND DATA

66	Indicator that data for maximum wind level and for vertical wind shear follow when max wind occurs at flight level.
77	Indicator that data for maximum wind level and for vertical wind shear follow when max wind level does not coincide with flight level.
P <sub>m</sub> P <sub>m</sub> P <sub>m</sub>	Pressure at maximum wind level in whole millibars.
d <sub>m</sub> d <sub>m</sub>	True direction from which wind is blowing at the maximum wind level rounded to nearest 5 degrees. Report hundreds and tens digits. The unit digit (0 or 5) is added to the hundreds digit of wind speed.

$f_m f_m f_m$	Wind speed in knots. Hundreds digit is sum of hundreds digit of speed and unit digit of direction, i.e. 295° at 125 kts encoded as 29625.
4	Data for vertical wind sheer follow.
$v_b v_b$	Absolute value of vector difference between max wind and the wind 3000 feet BELOW the level of maximum wind, reported to the nearest knot. Use "/" if missing and 4 group is reported. A vector difference of 99 knots or more is reported with the code figure "99".
$v_a v_a$	Absolute value of vector difference between max wind and the wind 3000 feet ABOVE the level of maximum wind, reported to the nearest knot. Use "/" if missing and 4 group is reported. A vector difference of 99 knots or more is reported with the code figure "99".
77999	Indicator that maximum wind data have not been observed.

## SECTION 10 - NATIONAL PRACTICES

- 61616 Mission identifier followed by the observation number (e.g., AF968 WSWSC TRACK 51 OB 23)
- Agency/Aircraft Identifier (first group): For the U.S. Air Force, use AF plus the last three digits of the aircraft's tail number; for NOAA, use NOAA plus the last digit of the aircraft registration number.
  - Mission Indicator (type of mission being flown) (second group): For a training mission, the mission indicator is WXWXX; for an operational mission, the indicator is WSWSX. The fifth letter "X" is used to distinguish where the mission is being flown. The "A" indicates that the flight is in the Atlantic basin. The letter "C" indicates the Central Pacific area, and the letter "E" indicates the Eastern Pacific.
  - Third group will be TRAIN (for a training mission) or the flight track tasked (TRACK XX).
  - The fourth group is the observation number (both vertical and horizontal) as transmitted from the aircraft (OB XX).
- 62626 National practice group indicator preceding a free form character string containing specific sonde or mission-related remarks. Remarks include:
- SPL XXXXNXXXXXW - Impact location of the sonde based on its last GPS position.
  - MBL WND dddff - The mean wind in the lowest 500 meters of the sounding.
  - LAST WND XXX - Height of the last reported wind. If a surface wind is reported, the Last Wind remark is omitted. XXX will never be less than 13 meters.
  - AEV XXXXX - This is the software version being used for the sounding.
  - DLM WND dddff bbbttt - the average wind over the depth of the sounding. Where dddff is the wind averaged from the first to the last available wind (these would correspond to the first and last significant levels for wind); ttt is the pressure at the top of the layer, and bbb is the pressure at the bottom of the layer (in whole mbs, with thousands digit omitted).
  - WL150 dddff zzz - Average wind over the lowest available 150 m of the wind sounding. Where dddff is the mean wind over the 150 m layer centered at zzz m.

**CODE FORM:****PART B**

SECTION 1       $M_i M_i M_j M_j$    YYGG/    $99 L_a L_a L_a$     $Q_c L_o L_o L_o$     $MMMU_{La} U_{Lo}$

SECTION 5       $n_o n_o P_o P_o P_o$     $T_o T_o T_{ao} D_o D_o$

$n_i n_i P_i P_i P_i$     $T_i T_i T_{ai} D_i D_i$

$n_n n_n P_n P_n P_n$     $T_n T_n T_{an} D_n D_n$

SECTION 6      21212    $n_o n_o P_o P_o P_o$     $d_o d_o f_o f_o f_o$

$n_i n_i P_i P_i P_i$     $d_i d_i f_i f_i f_i$

$n_n n_n P_n P_n P_n$     $d_n d_n f_n f_n f_n$

SECTION 7      31313    $s_{ra} r_a s_a s_a$    8GGgg

SECTION 9      51515    $101 A_{df} A_{df}$    or

$101 A_{df} A_{df}$     $0 P_n P_n P'_n P'_n$    or

$101 A_{df} A_{df}$     $P_n P_n h_n h_n h_n$

SECTION 10    61616   Repeat national practice encoded in Part A.  
62626   Repeat national practice encoded in Part A.

**PART B****SECTION - 1 IDENTIFICATION AND POSITION**

$M_j M_j$       Identification letters of the part of the report = BB.

/      Filler figure for last digit of YYGG group. No wind groups reported for any of the significant isobaric surfaces.

All other groups are the same as reported in Part A - Section 1

**SECTION 5 - DATA FOR SIGNIFICANT TEMPERATURE  
AND RELATIVE HUMIDITY LEVELS**

$n_o n_o$       Number of level, starting with surface level. Only surface level will be numbered as "00."

$n_i n_i$       When a standard level is also selected as significant, repeat the level in section 5. Encode

$n_n n_n$       significant levels to indicate missing data as nn/// /////.

$P_o P_o P_o$       Pressure at specified levels in whole millibars, beginning with surface.

$P_i P_i P_i$

$P_n P_n P_n$

Temperature and humidity data groups are reported in the same manner as the temperature and humidity data in Part A - Section 2.

## SECTION 6 - DATA FOR SIGNIFICANT WIND LEVELS

21212 Data for significant levels with respect to wind follow. Wind data groups are reported in the same manner as the wind data in Part A - Section 2.

## SECTION 7 - SOUNDING SYSTEM INDICATION

31313 Data on sounding system.

$s_r$	Identifies solar and infrared radiation correction. Always report as zero--no correction.
$r_a r_a$	Identifies dropsonde/sounding system used. Always report as "96"--descending radiosonde.
$s_a s_a$	Identifies tracking technique/status of system used. Reported as "00" or "08." "0" - Aircraft system has no windfinding capability. "8" - Automatic satellite navigation.
8	Indicator for time of observation.
GGgg	Actual time of dropsonde launch in hours (GG) and minutes (gg) UTC.

## SECTION 9 - ADDITIONAL DATA GROUPS

101A<sub>df</sub> A<sub>df</sub> Specifications of regional additional data being reported.

0	Group indicator.
$P_n P_n$	Pressure of specified levels in tens of millibars. (1007 mb=01, 945 mb=95, 726 mb=73).
$P'_n P'_n$	

$P_n P_n h_n h_n h_n$  Data reported in the same manner as in Part A - Section 2.

51515 Additional data in regional code follow.

10166 Geopotential data are doubtful between the following levels,  $0P_n P_n P'_n P'_n$ . This code figure is used only when geopotential data are doubtful from a level to termination of the descent. NOTE: When radar altimeter is inoperative and surface reference is used, or if the ARWO advises that geopotential platform data is doubtful, a 10166 is reported for the entire run.

10167 Temperature data are doubtful between the following levels:  $0P_n P_n P'_n P'_n$ . This code figure shall be reported when only temperature data are doubtful for a portion of the descent. If a 10167 group is reported a 10166 will also be reported. EXAMPLE: Temperature is doubtful from 540mbs to 510mbs. SLP is 1020mbs. The additional data groups would be: 51515 10166 00251 10167 05451.

10190 Extrapolated altitude data follows:

1. When the sounding begins within 25mbs below a standard surface, the height of the surface is reported in the format 10190  $P_n P_n h_n h_n h_n$ . The temperature group is not reported. EXAMPLE: Assume the release was made from 310mbs, and the 300mb height was 966 decameters. The last reported standard level in Part A is the 400mb level. The data for the 300mb level is reported in Part B as 10190 30966.

2. When the sounding does not reach surface but terminates within 25mbs of a standard surface, the height of the standard surface is reported in Part A of the code in standard format and in Part B of the code in the format 10190  $P_n P_n h_n h_n h_n$ . EXAMPLE: Assume termination occurred at 980mbs, and the extrapolated height of the 1000mb level was 115 meters. The 1000mb level would be reported in Part A of the code as 00115 //// and in Part B as 10190 00115.

10191      Extrapolated surface pressure precedes.      Extrapolated surface pressure is only reported when the termination occurs between 850mbs and surface. Surface pressure is reported in Part A as 99P<sub>o</sub>P<sub>o</sub>P<sub>o</sub>///// and in Part B as 00P<sub>o</sub>P<sub>o</sub>P<sub>o</sub>////. When surface pressure is extrapolated, the 10191 group is the last additional data group reported in Part B.

61616      Same as Part A.

62626      Same as Part A.

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**FIGURE K-1. Example TEMP DROP Message.**

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**UZPN13 KNHC 010211**  
**XXAA 51023 99450 71352 15855 99994 08635 24030 00548 ///// /////**  
**92592 03817 23552 85273 00916 24555 70803 06366 25055 50539 16957**  
**24631 40702 29757 24634 30900 465// 25148 88999 66298 25149 419//**  
**61616 AF968 WSWSC TRACK 51      OB 23**  
**62626 SPL 4510N13483W MBL WND 23542 AEV 20108 DLM WND 23035 994314**  
**WL150 2335 075=**  
**XXBB 51028 99450 71352 15855 00994 08635 11850 00916 22742 07124**  
**33729 05162 44664 07396 55640 06599 66562 12598 77557 12777 88551**  
**12961 99538 13561 11481 18957 22449 23346 33406 28757 44356 36756**  
**55298 46732**  
**21212 00994 24030 11983 23037 22967 24040 33957 23548 44946 24046**  
**55892 24558 66850 24555 77742 24045 88656 24079 99575 24588 11497**  
**24632 22314 25136 33298 25149**  
**31313 09608 80158**  
**61616 AF968 WSWSC TRACK 51      OB 23**  
**51515 10166 09430**  
**62626 SPL 4510N13483W MBL WND 23542 AEV 20108 DLM WND 23035 994314**  
**WL150 23535 075=**

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